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“..... per litora spargite muscum,
 Naiades, et circum vitreos considite fontes:
 Pollice virgineo teneros hic carpite flores:
 Floribus et pietum, divæ, replete canistrum.
 At vos, o Nymphæ Craterides, ite sub undas;
 Ite, recurvato variata corallia trunco
 Vellite muscosis e rupibus, et mihi conchas
 Ferte, Deæ pelagi, et pingui conchyliis succo.”
N. Parthenii Giannettasi, Ecl. 1.

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I.—*On some new and rare British Crustacea.* By THOMAS SCOTT, F.L.S., Mem. Soc. Zool. de France, Naturalist to the Fishery Board for Scotland, and ANDREW SCOTT, Fisheries Assistant, University College, Liverpool.

[Plates I. & II.]

Genus *CLAUSIA*, Claparède * (1863).

(?) *Clausia Cluthæ*, sp. n. (Pl. I. figs. 1-12.)

Description of the Species.—*Female.* Length 1.3 millim. ($\frac{1}{19}$ of an inch). Body narrow, elongate, tapering gradually towards the posterior end. Antennules (fig. 2) short, stout, six-jointed, and moderately setiferous; there is not much difference in the length of the first, second, third, and last joints, except that the first is rather longer than the other three; the fourth and fifth joints are also subequal, but they are both shorter than any of the other joints, as shown by the formula—

Proportional lengths of the joints..	16	13	12	8	7	13
Number of the joints	1	2	3	4	5	6

* Not *Clausia*, Boeck (1864); as Claparède had already used this name, M. Boeck, in 1872, substituted the name *Pseudocalanus* for his genus.

Antennæ stout, three-jointed, middle joint considerably shorter than the first or third; no secondary branch (fig. 3). Mandibles simple, lamelliform, tapering towards the rounded ciliated apex and furnished with three stout plumose marginal setæ of unequal length (fig. 5). The maxillæ consist each of an oblong lamelliform appendage, the extremity of which is obliquely truncate, slightly rounded, and fringed with cilia (fig. 6). Anterior foot-jaws simple, one-jointed, armed with a stout elongate spine at the apex in addition to a smaller spine on the inner margin (fig. 7). The posterior foot-jaws form powerful grasping-organs; they are each two-jointed, with the joints short and very robust; the end-joint terminates in a broadly truncate extremity, to the posterior half of which is articulated a strong slightly curved claw; the anterior angle is lengthened into a stout tooth-like process, against which the claw impinges, as shown by the drawing (fig. 8). The first and second pairs of feet are somewhat similar in structure; the outer branches are three-jointed and the inner two-jointed; the exterior distal angles of the first and second joints of the outer branches are each furnished with a moderately stout spine, while the third joint bears four spines round the outer margin and apex and three long plumose setæ on the inner margin; the second joint of the inner branches bears three plumose setæ round the inner margin and apex and a small apical spine; a long plumose seta also springs from the inner margin of the first joint; the outer branches are only slightly more elongate than the inner branches (fig. 9). The third and fourth pairs of feet are also nearly alike in structure, but differ considerably from the first and second pairs; each of the third and fourth pairs is composed of a three-jointed outer branch and an almost obsolete one-jointed inner branch; the small rudimentary joint of which the inner joint consists possesses apparently neither seta nor spine (fig. 10). Fifth pair large and prominent and composed of a single two-jointed branch; the end-joint, which is much shorter than the other, is furnished with three moderately stout and plumose terminal setæ, the middle one being considerably longer than the other two (fig. 11). Caudal stylets equal to about half the length of the last abdominal segment (fig. 12).

Habitat. Ayr Bay, Firth of Clyde. Among trawl-refuse; one specimen.

Remarks. Though the species now described was obtained among some trawl-refuse unattached to any other organism, it is apparently a parasitic form of some kind; the structure of the antennæ and the simple form of the mandibles and

maxillæ, combined with the remarkably powerful posterior foot-jaws and fifth pair of feet, are fairly satisfactory evidence of its parasitic habits. This species, if not congeneric with Claparède's genus *Clausia*, is at least very closely allied to it, and therefore till further specimens, especially male, be obtained, to permit of a more thorough examination being made, we prefer meanwhile to place it in that genus.

(?) *Clausia Cluthæ* somewhat resembles *Clausia Lubbockii*, Claus, in general appearance; but the difference in the structure of the antennules and fifth pair of feet distinguishes it at once from that species.

Maraenobiotus Vejdovskyi, Mrazek.

(Pl. I. figs. 13-21; Pl. II. fig. 23.)

This curious freshwater Copepod was described for the first time by Herr Al. Mrazek in the seventh volume of the 'Zoologische Jahrbücher' (1893), p. 103, Taf. iv. figs. 17-32, and Taf. v. figs. 33-37. The following brief description (with drawings) is prepared from Scotch specimens:—

Female. Length .67 millim. ($\frac{1}{37}$ of an inch). Body slender and elongate (fig. 13), and in this respect somewhat similar to *Ophiocamptus*. Antennules short, eight-jointed (Pl. II. fig. 23). Secondary branches of antennæ two-jointed, the end-joint shorter than the other (Pl. I. fig. 14). Both branches of the first pair of swimming-feet two-jointed and nearly of equal length (fig. 18). Inner branches of the next three pairs two-jointed and considerably shorter than the three-jointed outer branches (fig. 19). Fifth pair small; inner portion of the basal joint not much produced, broadly truncate and furnished with four moderately short and subequal plumose setæ on the margin of the truncate apex; secondary joint very small, ovate, and provided with three terminal setæ, the inner one somewhat like those on the basal joint, the other two subequal and fully twice as long (fig. 20). Caudal stylets short and stout; the principal seta of each stylet is articulated at the base and dilated, as shown in the drawing (fig. 21).

Habitat. Loch Vennachar, Perthshire; not very common.

Remarks. This species, which is an addition to the British fauna, is readily distinguished from other British Harpacticids by the structure of the first pair of swimming-feet, both branches of this pair being two-jointed; the mandibles, maxillæ, and foot-jaws resemble those of *Canthocamptus*, except that the mandible-palp is rudimentary and represented by a few setæ that spring from a papilliform lateral process.

The rudimentary character of the mandible-palp, together with the two-jointed outer branches of first pair of feet, separate *Maraenobiotus* distinctly from any other genus of the freshwater Harpacticidæ. We have not been able to give a figure of the mandible-palp, and therefore quote the following reference to it from Herr Al. Mrazek's description. He says:—"Als ein wichtiger Charakter muss hervorgehoben werden, dass der Mandibularpalpus sehr rückgebildet ist, nämlich nur durch einen kleinen drei schwache Borsten tragenden Höcker repräsentirt wird."

Attheyella Duthiei, sp. n. (Pl. II. figs. 1-13.)

Description of the Species.—*Female.* Length .9 millim. ($\frac{1}{2\frac{1}{8}}$ of an inch). Posterior margins of the second to the fifth thoracic segments serrulated; the abdominal segments have a fringe of cilia posteriorly; rostrum of moderate length (fig. 1). Antennules short, eight-jointed; the first two joints are more dilated than the others and the fifth and seventh are somewhat shorter; the approximate proportional lengths of the joints are shown by the formula—

Proportional lengths of the joints..	16	16	13	12	10	13	9	13
Number of the joints	1	2	3	4	5	6	7	8

The antennules are moderately setiferous and bear a short sensory filament at the upper angle of the fourth joint (fig. 2). Antennæ stout, two-jointed; the secondary branch consists of a single comparatively slender and elongate joint, which is furnished with a few setæ at the distal end (fig. 3). The mandibles have the biting-part armed with two or three lamelliform plates slightly notched at the apex; the mandible-palp has the basal portion moderately stout, to which is articulated near the distal end a single one-jointed setiferous branch (fig. 4). Maxillæ and first and second foot-jaws somewhat similar to those of *Canthocamptus hirticornis*, T. Scott. The inner branches of the first pair of swimming-feet, which scarcely reach beyond the end of the outer branches, are composed of two joints of nearly equal length, but the end-joint is much more slender than the other; the first joint bears a short plumose seta near the distal end and the second joint a similar seta near the middle of the inner margin, while the inner and outer margins of both joints are more or less fringed with cilia; in the second joint the middle one of the three terminal setæ is very long and slender, the inner one is very short and plumose, while the outer is elongate, slender, and somewhat claw-like; the outer branches, which are com-

posed of three nearly equal joints, are armed with moderately long marginal spines, the outer margins of all the joints being also fringed with cilia (fig. 7). In the next three pairs the inner branches, which are also composed of two subequal joints, are much shorter than the outer branches; the outer three-jointed branches are elongate, and the principal terminal seta in both branches is very long and slender (fig. 8). In the fifth pair the inner portion of the basal joint is broadly subtriangular and bears about six elongate setæ of unequal length round the apex; the secondary joint is broadly ovate and furnished with two setæ on the outer margin and three at the end, the middle one of the terminal three is extremely long and slender, the inner margin is ciliated (fig. 11). Caudal stylets about equal in length to the last abdominal segment (fig. 13).

The male antennules form powerful grasping-organs. The second pair of swimming-feet differ somewhat from those of the female in that the first joint of the inner branches is armed with curved tooth-like processes, as shown in the drawing, and the marginal spines of the first and second joints of the outer branches are much stouter than those of the same joint in the female (fig. 9). The end-joint of the inner branches of the third pair in the male terminates in two moderately long and slightly curved processes, which are of nearly equal length; a small plumose seta also springs from near the base of the terminal processes (fig. 10). The male fifth pair are small, the inner produced part bears two stout, moderately long, and spiniform terminal setæ; the secondary joint is furnished with five setæ arranged as shown by the drawing (fig. 12). The first abdominal segment is furnished at the outer distal angle on the ventral aspect with three setæ (fig. 12 a).

Habitat. Brough Loch, Island of Yell, Shetland.

Remarks. This species somewhat resembles *Ophiocamptus brevipes* (G. O. Sars), but in that species the antennules are seven-jointed, the end-joint of the inner branches is shorter than, but nearly as stout as, the first joint, and the secondary joint of the fifth pair is considerably narrower; there is also some difference in the structure of the mandible and in the length of the caudal stylets. It is interesting, however, to observe an oval pellucid area on the dorsal surface of the cephalic segment, similar to that shown in the drawing of *Ophiocamptus brevipes* by Herr Al. Mrazek*. As we do not

* "Beitrag zur Kenntniss der Harpacticidenfauna des Süßwassers," Zoologische Jahrbücher, siebenter Band, p. 116, pl. v. fig. C6, pl. vi. figs. 67-70.

know of any described species similar to this Shetland form we have named it in honour of Mr. Duthie, Fishery Officer, Shetland; it is because of his interest and zeal for natural history work that we have been able to add considerably to the knowledge of the freshwater Crustacea of the Shetland Islands.

(?) *Canthocamptus parvus*, sp. n.
(Pl. II. figs. 14-22.)

Description of the Species.—Female. Length .37 millim. ($\frac{1}{70}$ of an inch). Body moderately stout; antennules short, six-jointed; the first three joints subequal and robust, the last three also subequal, but considerably smaller than the first three (fig. 15). Secondary branch of the antennæ unarticulate, very small, and bearing a short plumose terminal seta (fig. 16). Mandible-palp small; basal joint moderately stout, bearing at the obliquely truncate end a very small one-jointed branch, which is furnished with three short plumose setæ (fig. 17). Other mouth-organs similar to those in typical *Canthocamptus*. The first pair of swimming-feet somewhat resemble those of *Canthocamptus trispinosus*; the first joint of the inner branches is rather longer than the entire length of the outer branches; the second and third joints are together equal to about half the length of the first joint, but the second is rather shorter than the third; the third joint bears two terminal setæ, one short and spiniform, the other about twice the length and more slender; a short seta springs from near the middle of the inner margin of the first joint; there are also a few minute setæ on the outer margins of all the joints (fig. 18). The inner branches of the next three pairs are short and composed of two nearly equal joints; outer branches elongate, three-jointed, the end-joint rather longer than either of the other two (fig. 19). Fifth pair small, inner portion of the basal joint broadly foliaceous, apex obliquely truncate and bearing five setæ of unequal length; four of them are moderately short, and one (the second from the outside) more elongate; secondary joint subquadrangular, rather longer than broad, and furnished with five small apical setæ, the two innermost of which are longer than the others (fig. 21). Caudal stylets very short.

Male. The male differs little from the female except that the antennules are apparently eight-jointed and of a complicated hinged structure adapted for grasping. The inner branches of the third pair of swimming-feet in the male are three-jointed and rather longer than the inner branches of the

same pair in the female; the second joint bears a small seta on the inner angle and the last joint is furnished with two terminal setæ (fig. 20). The male fifth pair are very small, the inner portion of the basal joint is somewhat triangular in form and carries three small apical setæ; the secondary joint is subrhomboid and provided with five setæ round the end, as shown in the drawing (fig. 22).

Habitat. Between tide-marks at Aberlady Bay, Firth of Forth.

Remarks. In *Canthocamptus* the antennules are usually eight- or nine-jointed, but in the small species now described they are only six-jointed, and the secondary branches of the antennæ are uniaarticulate and almost rudimentary; but in other respects it possesses all the characters of a typical *Canthocamptus* according to the present definition of that genus.

We have pointed out elsewhere* that from the great variation in the structural details of the species of which the genus *Canthocamptus* is composed a revision of the genus will ere long be necessary; when that is done, it may be found expedient to remove the species now described into another genus; but meanwhile the genus *Canthocamptus* appears to be the only group of the Harpacticidæ to which it can be allocated.

EXPLANATION OF THE PLATES.

PLATE I.

(?) *Clausia Cluthæ*, sp. n.

Fig. 1. Female, dorsal view, $\times 40$. 2. Antennule, $\times 170$. 3. Antenna, $\times 253$. 4. Mouth, $\times 500$. 5. Mandible, $\times 500$. 6. Maxilla, $\times 500$. 7. Anterior foot-jaw, $\times 760$. 8. Posterior foot-jaw, $\times 253$. 9. Foot of first pair of swimming-feet, $\times 170$. 10. Foot of fourth pair, $\times 170$. 11. Foot of fifth pair, $\times 127$. 12. Last abdominal segment and caudal stylets, $\times 170$.

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Fig. 13. Female, side view, $\times 80$. 14. Antenna, $\times 380$. 15. Maxilla, $\times 380$. 16. Anterior foot-jaw, $\times 380$. 17. Posterior foot-jaw, $\times 380$. 18. Foot of first pair of swimming-feet, $\times 253$. 19. Foot of fourth pair, $\times 253$. 20. Foot of fifth pair, $\times 380$. 21. Last abdominal segment and caudal stylets, $\times 253$.

PLATE II.

Attheyella Duthiei, sp. n.

Fig. 1. Female, side view, $\times 50$. 2. Antennule, $\times 253$. 3. Antenna

* Ann. Scot. Nat. Hist., Oct. 1895.

× 253. 4. Mandible, × 380. 5. Anterior foot-jaw, × 380. 6. Posterior foot-jaw, × 380. 7. Foot of first pair of swimming-feet, × 170. 8. Foot of fourth pair, × 170. 9. Foot of second pair (male), × 170. 10. Foot of third pair (male), × 170. 11. Foot of fifth pair, × 170. 12. Foot of fifth pair (male), × 253. 12*a*. Appendage of first abdominal segment. 13. Last two abdominal segments and caudal stylets, × 125.

(?) *Canthocamptus parvus*, sp. n.

Fig. 14. Female, side view, × 80. 15. Antennule, × 380. 16. Antenna, × 380. 17. Mandible, × 380. 18. Foot of first pair of swimming-feet, × 253. 19. Foot of fourth pair, × 253. 20. Foot of third pair (male), × 253. 21. Foot of fifth pair, × 380. 22. Foot of fifth pair (male), × 380.

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Fig. 23. Antennule, × 253.

II.—Notes on the Parasitic Copepoda of Fish obtained at Plymouth, with Descriptions of new Species. By P. W. BASSETT-SMITH, F.Z.S., F.R.M.S., Surgeon R.N.

[Plates III.—VI.]

IN taking up this subject I am chiefly indebted to Prof. F. Jeffrey Bell, who suggested it to me as being likely to prove a fruitful and interesting investigation to fill up time while stationed at Plymouth. This I the more willingly did, having the kind assistance of the Director of the Marine Biological Association's Laboratory and others there, to whom I tender my best thanks. The greater part of the material was, however, obtained by daily and diligent search at certain fishmongers in the town.

Although there are many admirable monographs and treatises dealing with these curious and often *bizarre*-looking animals, they are chiefly of somewhat ancient date: the most important are:—

- MÜLLER. 'Entomostraca.' 1785.
 OTTO and BURMEISTER. 'Nova Acta Natur. Curios,' 1826. 1831.
 KRÖYER. 'Naturhist. Tidsskrift,' 1838 and 1863.
 MILNE-EDWARDS. Treatise, 'Crustacés,' tome iii. 1840.
 NORDMANN. 'Mikrographische der wirbellosen Thiere.' 1832.
 CLAUS. Monographs. 1860-1875.
 CARL VOGT. 'Archives Zoologie expér.,' tome xvi. 1877.
 CAMIL HELLER. "Crustaceen," Reise der Fregatte Novara.
 HESSE. Monographs. 1862-1868.
 VAN BENEDEN. 'Note sur un Crustacé parasite nouveau, &c.' 1861.
 BAIRD. 'British Entomostraca.' 1850.
 GERSTAECKER. "Copepoda," Bronn's 'Thierreich.'
 KURZ. Monograph. 1877.